■ PICKING A NEW CEO AMERICA'S COMPETITIVE REVIVAL ■

JANUARY 4, 1988

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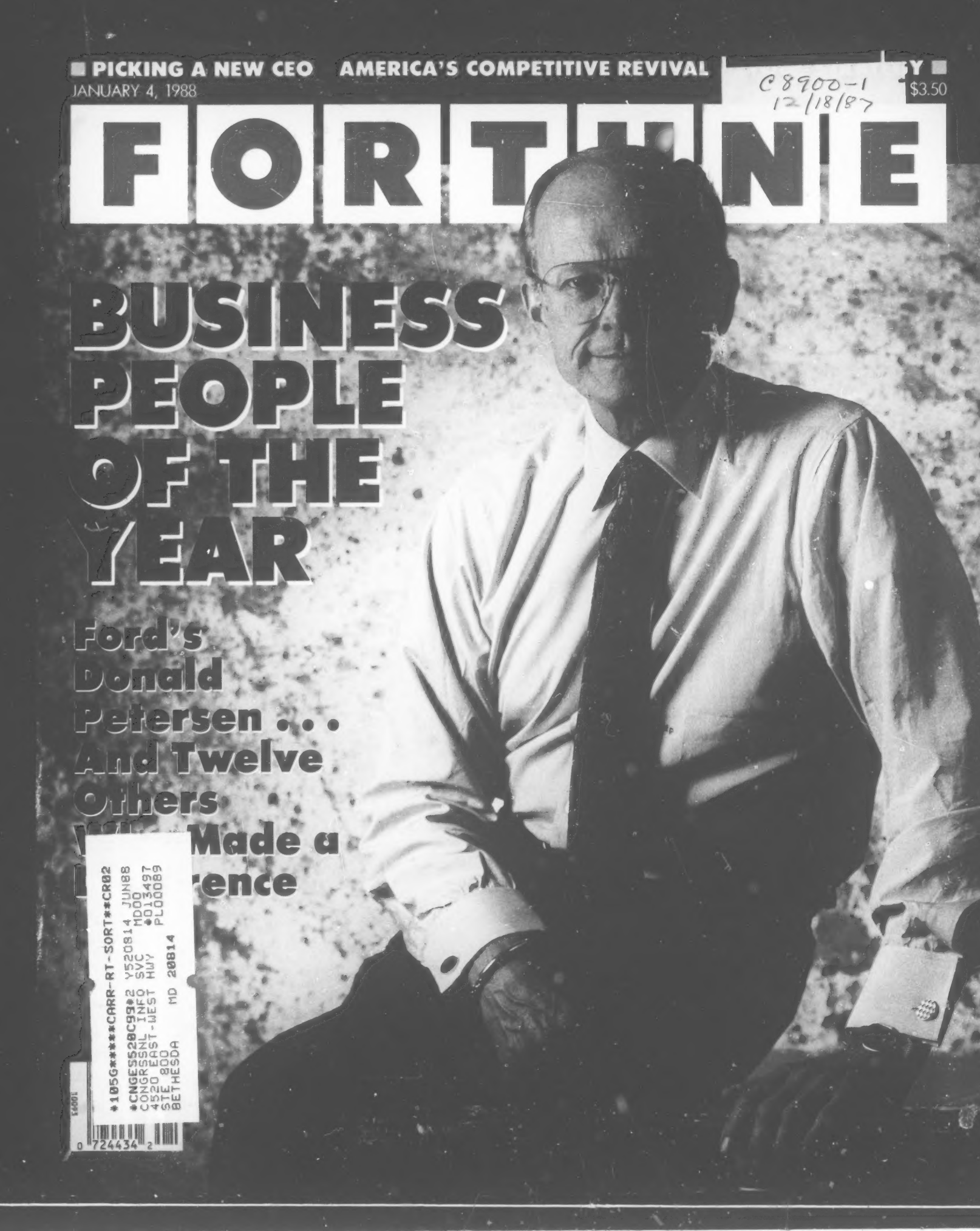
FORTUNE

BUSINESS PEOPLE OF THE YEAR

Ford's Donald Petersen . . . And Twelve Others Who Made a Difference



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JANUARY 4, 1988 VOL. 117, NO. 1

FORTUNE

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WHAT SHAPES—and shakes—the world of business? Not a lot of uncontrollable forces but the decisions and actions of remarkable men and women. FORTUNE's 22-page report on the Business People of the Year focuses on a baker's dozen of extraordinary individuals. They range from a German scientist who pads around his lab in white socks and sandals to the buttoned-down manager who turned Ford into the world's most profitable automaker.

The report was supervised by editor Geoffrey Colvin, an inveterate people watcher. "Many readers won't know a thing about some of these people," Colvin notes, "yet each did something of great importance this year. Take Reginald Lewis. In one act, one deal, he changed the perception of black business in America." Though editing tends to be a behind-the-scenes profession, Colvin is himself a fairly well-known person: His *Inside Business* broadcasts are heard on many CBS radio stations.

The writers shown here discovered unexpected details about their subjects that make their stories compelling. By tracking down Elaine Garzarelli's mother, reporter Chris Knowlton learned that the investment sage of Shearson Lehman Brothers was a wild teenager whose competition with her brother spurred her to academic excellence. Citicorp's chairman, John Reed, opened up after he learned that Los Angeles bureau chief Brian O'Reilly had tracked down *his* brother. In a long interview, O'Reilly asked if his sibling was correct in describing Reed as a poor student when he was a child. Reed said yes, and for the first time publicly discussed his problems with dyslexia.

"Biography is one of the best-selling categories of books," Colvin observes. "That means people are most interested in reading about people, particularly unusual and successful people." We think you will enjoy meeting these.

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JON SIMON—GAMMA/LIAISON

When E.F. Hutton talked, Shearson's Cohen, right, bought the firm.

National Association of Convenience Stores, whose members pump a third of the gas sold in the U.S., complain about the cost: between $12,000 and $25,000 per station.

Gas pumpers would rather see the fumes captured in the charcoal-filled canisters on a car's fuel line. The EPA announced plans last summer to require bigger canisters than the ones already in place. Automakers balked, claiming they would cost $80 a car; the EPA says the figure is $19.

Recently New York, New Jersey, and the six New England states announced plans to join California in requiring that only gasoline low in butane be sold during the summer. Butane would be allowed to rise slightly in the winter, when it is needed to speed ignition. The EPA proposes a similar plan.

Autos sold in the U.S. after 1971 have been designed to run best on gas that adheres to the lower limits. But refiners object. William O'Keefe, vice president of the American Petroleum Institute, claims the decrease in butane will lead to increased imports because more crude oil will be needed to produce a gallon of gas.

STAFF *Kate Ballen, Alan Farnham, Carrie Gottlieb, Christopher Knowlton, Stephen J. Madden, Louis S. Richman, Patricia Sellers*

Shearson Hutton?

■ Whatever they name it, the behemoth formed by the merger of **Shearson Lehman Brothers** and **E.F. Hutton** could become the best-integrated and most profitable brokerage house in the U.S., surpassing rival **Merrill Lynch** in equity capital and the number of worldwide offices. Says Stephen Schwarzman of the Blackstone Group, who helped Hutton negotiate the merger: "This is a ten-strike deal for Shearson."

The guy with the ball is Peter Cohen, 41, who prefers gardening to bowling. Cohen arranged the Lehman acquisition in 1984 and deftly merged the two firms. One of Wall Street's toughest managers, he runs Shearson like an industrial company, keeping a sharp eye on costs. Reportedly willing to pay $1.6 billion for Hutton last year, he picked it up recently for $960 million. Says he: "Obviously, I feel okay about the price."

Morale at Hutton has been poor since a 1985 guilty plea to a check-kiting scheme launched the firm on its toboggan run to extinction. Nor will it improve soon. Layoffs and attrition will cut about 5,000 of the 20,000 New York–based employees of the combined firms. But Cohen is determined to retain as much of the sales force as he can, especially key Hutton producers, brokers who bring in $500,000 or more in annual commissions. Says Cohen: "Size isn't the issue for us. We just want to be good."

No Massachusetts miracle for insurers

■ While Massachusetts Governor Michael Dukakis campaigns for President on his state's economic successes, one group of companies is bailing out of the Bay State: auto insurers. **Fireman's Fund** recently decided to hit the road after losing $31 million on its auto business last year. Now **Kemper Group**, with projected losses of $37 million for 1987, wants to pull out too.

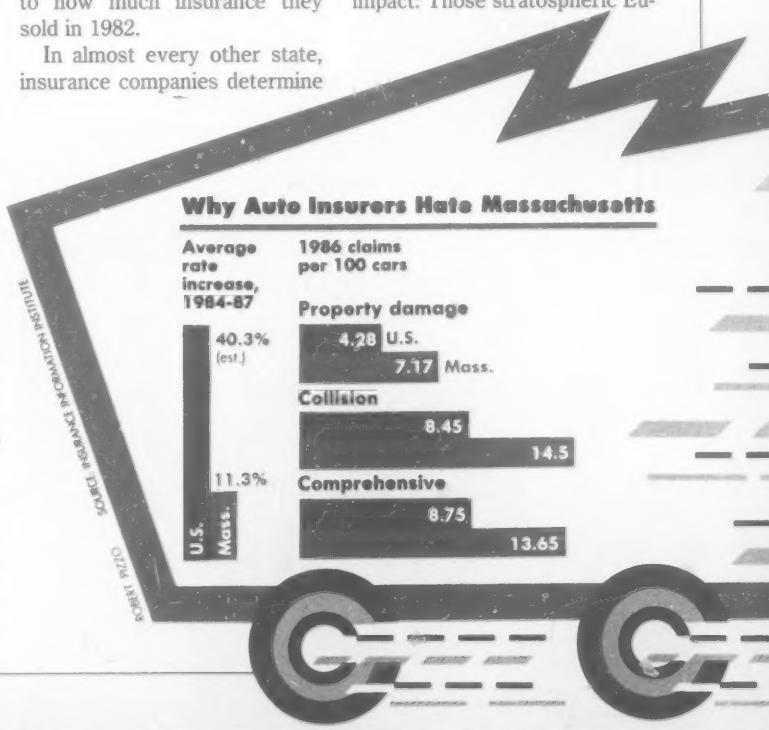
Massachusetts has the highest rate of car theft in the U.S., and fully 54% of the drivers fall into its high-risk category. State law prohibits insurance companies from charging bad drivers higher premiums. Instead the insurers put all the high risks into a pool, and the companies pay a share of those claims according to how much insurance they sold in 1982.

In almost every other state, insurance companies determine rates, subject to approval by the state. In Massachusetts the insurance commissioner sets the premiums. Insurers say these rates do not cover costs, and want a 32% increase. Since Massachusetts auto rates are already among the highest in the U.S., they are unlikely to get even half that.

It gets worse. Dukakis's miracle state penalizes insurance companies that try to leave. Fireman's Fund agreed to pay $45 million as an exit fee. This amount will help cover Fireman's share of the high-risk pool over the next few years.

A fare break for Europe's flyers?

■ In about the same amount of time—2½ years—it took Ronald Reagan and Mikhail Gorbachev to agree to eliminate an entire category of nuclear missiles, the Common Market's 12 transportation ministers came up with a scheme to deregulate Europe's airlines. But don't expect atomic impact: Those stratospheric Eu-



COMPETITION

AMERICA'S COMPETITIVE REVIVAL

The awful trade figures obscure a striking fact: The U.S. is now the low-cost producer in many industries. ■ *by Sylvia Nasar*

SO SUDDENLY that it almost defies belief, the U.S. has seized the lead in the race for global competitiveness. Many of its industries have become the world's low-cost producers. Manufacturers on U.S. soil are gearing up to send Fords to Frankfurt, TVs to Tokyo—perhaps even steel to Seoul. As a result, the export boom now gathering momentum could rival the one that started in 1977 after the dollar fell 25%.

Despite another record trade gap in October, U.S. exports are up 13% from a year ago and are rising three times faster than world demand. Half the increase in industrial production during the third quarter came from exports—and that was before the dollar's October plunge. As Donald Straszheim of Merrill Lynch puts it: "The U.S., not Japan, is the export-led economy now."

How to account for the sudden reversal? The cheaper dollar, of course. But the currency shift could not do its job had it not been preceded by the gut-wrenching overhaul of industry upon industry, including all-out efforts to raise efficiency, slash costs, make better products, and sell them more aggressively. Finally, it's beginning to become apparent that the U.S. was not quite the industrial basket case many made it out to be.

A caveat: Gains—at home and abroad—will not come as easily this time as they did in the late Seventies, when the U.S. enjoyed a string of trade surpluses that lasted through 1981 by claiming its piece of an ever-expanding pie. Today many imports have made themselves thoroughly at home in the U.S., and markets for exports are growing only sluggishly. U.S. companies will have to grab market share back from competitors who are much tougher now. Among them are Latin American and East Asian newly industrialized countries (NICs) that can pick up new technologies almost as fast as they are developed in the major industrial nations. But barring highly improbable reversals—a resurgence of the dollar, a relapse on the part of U.S. industry—the U.S. should be able to recapture a great deal of business. The physical volume of the trade deficit turned long ago, and the dollar balance will follow as rising import prices start hitting sales harder.

There's no question that the dollar's decline is the chief player in the new competitiveness drama. Today it is back to where it was in the days when the U.S. ran healthy trade surpluses. On the trade-weighted index of the dollar vs. ten currencies compiled by the Federal Reserve, the dollar now stands just about at its 1980 value. Since U.S. exporters haven't raised their dollar prices much, overseas customers have been handed a discount that amounts to rolling-back prices five or six years.

True, the dollar has weakened only a little or not at all against the currencies of partners that account for roughly half of U.S. trade: Latin America, Canada, and the newly industrialized countries of the Pacific Rim (except for the Taiwan dollar, which has appreciated about 37% since 1985). What that observation overlooks is that the dollar did not strengthen much against these currencies in the first place. The modest weakening has put the dollar back where it was in 1980.

The new currency relationships powerfully boost the ability of the U.S. to compete with virtually all its major trading partners. It now has a clear edge over European manufacturers. They account for about a quarter of U.S. trade, with the U.S. importing shoes, cars, aircraft, organic chemicals, and machinery and exporting aircraft, computers, and chemicals. In West Germany current trends are working heavily against exporters. Though many are moving to restructure, particularly in the metals and capital goods industries, wages are advancing at a rate of 4.5% to 5% a year and productivity is stagnating.

REPORTER ASSOCIATES *Leslie Brody and Lorraine Carson*

A triumph of technology: *Countries like Chile*

have richer ore and cheaper labor, but Phelps Dodge can make copper for less with its new "electrowinning" process that extracts pure metal from mining wastes.

Japan's tremendous price advantage has all but disappeared: Manufacturing costs are about the same now as in the U.S. The Japanese are responding with breathtaking speed by holding down wage increases and boosting productivity. The strong yen, moreover, is slashing the cost of imported raw materials such as coal and iron ore. But these trends cannot wipe out the effects of the huge appreciation. The U.S., whose exports to Japan have been concentrated in aircraft, computers, organic chemicals, and pharmaceuticals, will now be able to export more cars, steel, and machine tools.

The U.S. is at least as competitive against Canada, its largest trading partner, as it was at the start of the Eighties. The Canadian dollar is about 12% weaker than in 1980, but unit labor costs have risen more than in the U.S. The trade deficit with Canada has increased chiefly because of faster U.S. growth, especially the five-year surge in auto sales. American carmakers build components, large cars, and minivans in Ontario to take advantage of cheaper labor and energy costs.

American competitiveness has improved least against the NICs, which account for nearly as much of U.S. manufactured goods trade as the Europeans. Labor costs are a fraction of those in industrialized countries. Productivity is rising rapidly. And so are these countries' manufacturing savvy and production capacity. Even so, U.S. exports

PHOTOGRAPH BY MICHAEL MELFORD

to the NICs should grow since they include many components for assembly and reexport, some destined for third countries.

No one should be surprised or dismayed that the competition is tougher today than it used to be. "That's what we mean by economic development in the rest of the world," says William Branson, an economist at the International Monetary Fund. Since the late Fifties, other countries have been closing the gigantic lead in economic power held by the U.S. at the end of World War II. Productivity, real wages, and profitability in manufacturing have been growing faster abroad than in the U.S. Similarly, the American edge in technology—in everything from spacecraft to supercomputers—has shrunk. Americans can no longer claim to make the best of everything: Others now build better cars, 256K D-Rams, TVs, and high-performance machine tools, to name just a few.

But the major causes of today's trade deficit lie in forces that manufacturers could not control—the strong dollar, powerful U.S. domestic demand, and the collapse of Latin American export markets due to those countries' heavy debts.

IT IS EASY to forget that the U.S. is still the world's biggest producer in most major industries, among them aluminum, paper, aircraft, and computers. It is the technology leader in computers, scientific instruments, and telecommunications equipment. Its overall factory productivity is still the highest, though Japan has passed it in such industries as autos and electronics. And its industrial production has risen faster in the Eighties than in most other countries.

Lately, capital investment has been more robust than is generally appreciated. Capacity has expanded by one-fourth since 1979, more rapidly than in other industrialized countries. Walter Cadette, an economist at Morgan Guaranty, points out that the ratio of net capital stock to labor has recently been rising at its historical trend rate of 3% a year in manufacturing. Says Cadette: "That's strong evidence that the comeback of productivity isn't a one-shot deal."

What's more, the aggregate investment figures hide an important change: Resources have shifted out of declining industries and into growing ones. For example, since 1979 capacity fell by 25% in steel, was flat in nonferrous metals, and increased a mere 5% in textiles. Meantime capacity soared 35% in instruments, 40% in computers and other so-called nonelectrical machinery, and 59% in electric machinery and components.

All this said, the U.S. did lose its fighting edge during the late Seventies. Productivity growth collapsed and costs raged out of control, rising some 40% between 1977 and 1981—far faster than abroad. All the while, those foreign competitors were getting tougher.

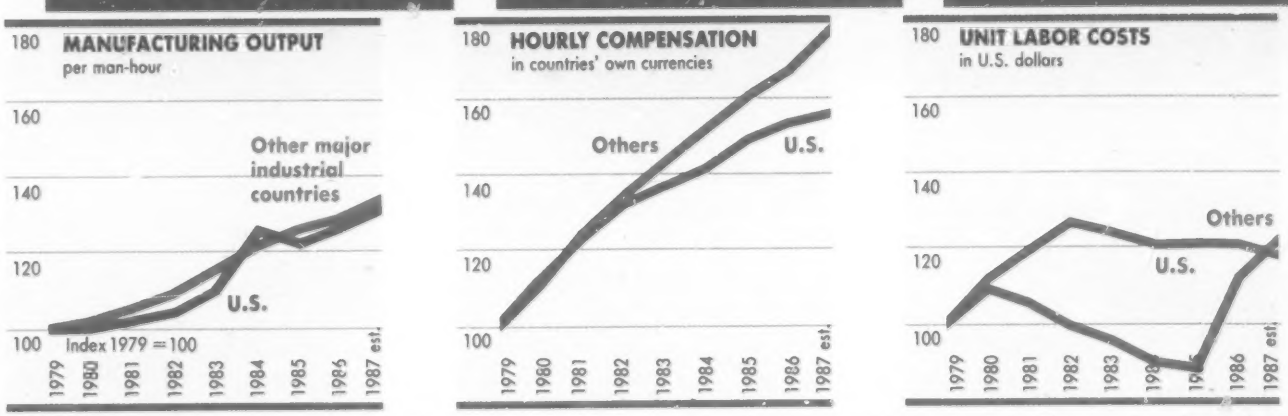
The critical changes began when the economy went into the tank and the dollar took off during the early Eighties. Company after company was forced to close inefficient plants and modernize others, spin off product lines it couldn't manage well, shed layers of bureaucracy, and trim the work force. What began as a desperate struggle for survival now looks increasingly like a sea change: a new managerial atmosphere in which competition at home and abroad forces continuous efforts to whittle costs, ratchet up quality, and develop new products.

Often the changes were spurred by corporate raiders and takeover threats. Unlike merger waves of the past, where the goals were diversifying, integrating vertically, or reducing competition, the restructuring wave of the Eighties was aimed at undoing an accretion of earlier bad strategic decisions—for example, promiscuous conglomeration. In most cases, says Robert Gay, senior economist at Morgan Stanley, financial restructuring went hand in hand with drives to improve efficiency and cut costs. More than half the mergers and acquisitions activity of this decade, according to a Morgan Stanley study, was concentrated in manufacturing, where international competition is hottest, though manufacturing accounts for just one-fifth of the nation's output.

THE RESTRUCTURING of the American pulp and paper business is a classic case. It enjoys comparative advantages galore. With a $110 billion domestic market, the industry can achieve tremendous economies of scale. Then there are all those fast-sprouting Southern pines, which mature in half the time it takes northern types. Japan, Scandinavia, and Canada, the largest producers after the U.S., can't expand capacity in commodity paper products because they cannot increase their raw material supplies enough, says security analyst Mark Rogers at Prudential-Bache.

But nature alone can't grow the fattest profit margins in the world, and plenty of other countries were giving the U.S. a hard time even before the dollar took off. The Finns

STRONG PRODUCTIVITY . . . AND LAGGING WAGES . . . GIVE THE U.S. THE EDGE

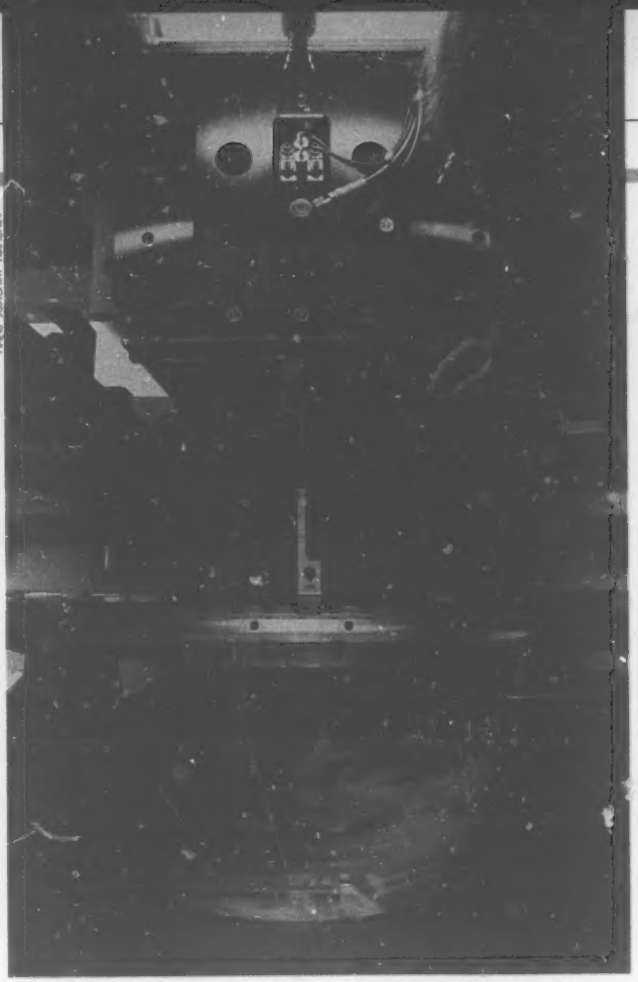


Since 1981 manufacturing productivity has grown faster in the U.S. than in other industrial countries—the first such spell in postwar history. Compensation has been rising more slowly. These trends—plus the lower dollar—have pushed U.S. unit labor costs below the average of its competitors.

THE WORLD'S TOP EXPORTERS

INDUSTRIES	1986 EXPORTS in billions of U.S. dollars		SHARES OF WORLD EXPORTS 1986	1980	World export growth rate 1986-95	OUTLOOK
AUTOMOBILES	$185.8	JAPAN	29.1%	24.6%	5.0%	Japanese manufacturers will keep gaining ground—partly by building in the U.S. Exports from U.S. carmakers will grow too.
		W. GERMANY	20.7%	21.5%		
		U.S.	11.9%	12.7%		
STEEL	$63.0	JAPAN	21.0%	22.9%	1.0%	The U.S. is narrowing the Japanese cost advantage and will remain the world's No. 2 steel producer, though a minuscule exporter.
		W. GERMANY	16.1%	17.1%		
		FRANCE	9.2%	10.4%		
APPAREL	$57.0	ITALY	13.4%	13.6%	8.4%	Pacific Rim producers will be the big winners. The U.S. industry will keep shrinking, but many manufacturers will prosper by filling niches.
		HONG KONG	11.6%	12.5%		
		KOREA	9.2%	7.5%		
TELECOM-MUNICATIONS	$41.6	JAPAN	33.5%	28.9%	8.1%	American makers will extend their dominance at the market's high end as the world shifts to digital technology. Japan is gaining at the low end.
		U.S.	11.1%	12.2%		
		W. GERMANY	8.5%	12.2%		
PETROCHEMICALS	$40.6	W. GERMANY	16.5%	17.7%	4.3%	U.S. products are highly competitive, but Canada, Venezuela, and several low-cost Middle Eastern oil producers are expanding capacity.
		U.S.	14.8%	16.6%		
		NETHERLANDS	10.4%	11.8%		
PLASTICS	$36.2	W. GERMANY	21.3%	22.3%	5.1%	Oil-rich countries have a growing cost advantage in commodity products. But U.S. export trade is booming in high-tech engineering plastics.
		U.S.	13.3%	15.0%		
		NETHERLANDS	11.4%	10.8%		
COMPUTERS	$33.1	U.S.	30.9%	47.1%	13.8%	U.S. producers will remain dominant, though some sales will come from new overseas subsidiaries. European and Japanese shares may rise faster.
		JAPAN	19.7%	3.8%		
		W. GERMANY	8.8%	10.5%		
INSTRUMENTS	$30.6	JAPAN	27.5%	22.0%	7.1%	A lead in software gives American producers the edge in sophisticated machines. Japanese and European rivals will set up factories in the U.S.
		U.S.	18.3%	20.1%		
		W. GERMANY	15.7%	17.3%		
PULP AND PAPER	$27.7	CANADA	19.2%	18.8%	5.7%	The U.S. industry, the world's biggest, is recapturing exports. Scandinavian costs are far higher. Canada mainly ships low-value newsprint.
		FINLAND	14.5%	14.7%		
		SWEDEN	13.0%	13.7%		
AIRCRAFT	$26.1	U.S.	47.2%	46.8%	2.5%	America rules the skies, but Europe's Airbus Industrie is aiming for 30% of the market by 1995. Many analysts think they'll get it.
		FRANCE	16.9%	14.0%		
		BRITAIN	10.8%	5.3%		
TEXTILES	$23.4	JAPAN	16.3%	16.0%	2.7%	The highly efficient and specialized U.S. industry should gain sales at home now that Japanese and European producers have no big cost advantage.
		W. GERMANY	15.4%	13.6%		
		ITALY	14.6%	12.6%		
PHARMACEUTICALS	$20.0	W. GERMANY	16.0%	16.5%	8.0%	A burst of new drugs and low production costs will fortify the U.S. market share. Foreign makers will expand production in the U.S.
		U.S.	13.5%	13.6%		
		SWITZERLAND	12.0%	12.2%		
SEMICONDUCTORS	$18.1	JAPAN	21.6%	11.3%	14.0%	Japan remains the champion cost cutter. Unless American companies shape up, the Japanese may grab 60% of the world market by 1995.
		U.S.	18.3%	22.5%		
		MALAYSIA	8.3%	11.3%		
ALUMINUM	$15.1	W. GERMANY	13.3%	11.5%	3.3%	Europe and the U.S. will lose in primary production to Canada and Latin America. But the U.S. will remain the biggest producer of finished metal.
		CANADA	12.0%	9.2%		
		NETHERLANDS	7.0%	6.9%		
MACHINE TOOLS	$13.2	JAPAN	27.3%	15.4%	2.6%	Germany dominates the high end and Japan the low, but the U.S. will hold its own from now on. Japanese companies will also build in America.
		W. GERMANY	24.3%	27.4%		
		SWITZERLAND	9.9%	7.7%		

SOURCE: DATA RESOURCES INC.



RAFIKA WHOOL SHAH

German ingenuity *makes Trumpf, the nation's biggest machine-tool builder, a leader in machines that turn out high-precision parts.*

have offset their high costs by pioneering new technologies. The Brazilians, with abundant, cheap power supplies, are the low-cost pulp producers.

The phenomenal restructuring wave that swept America, swallowing giants like Crown Zellerbach, St. Regis, and Diamond International, has rationalized product lines, held down compensation, and retired old machinery. Analysts figure that a significant part of the industry's earnings explosion since early 1986 can be traced to the greater efficiency and cost consciousness restructuring brought. Today the industry boasts some of the most modern facilities, probably the highest productivity, and quite possibly the fiercest cost-cutting management in the world. These strengths, and the dollar's fall, are helping manufacturers regain overseas markets, especially in Europe and Japan.

A notably bad habit partly combed out of the American system during the upheavals of the Eighties was the self-indulgence of pay increases unmatched by productivity gains. For workers and middle managers, if not top executives, the changes have been dramatic. Manufacturing compensation, which had been rising 10% a year dur ing most of the Seventies and outpaced gains in the rest of the economy, slowed to less than 2.5% a year by the mid-Eighties.

MORE IMPORTANT, compensation has been growing at a slower rate in the U.S. than abroad, and the trends have produced stunning shifts. German workers now earn about 25% more per hour than U.S. workers, says Roger Brinner, chief economist at Data Resources. Three years ago they earned 25% less. Japanese workers still g. .ess pay than U.S. workers but the gap is narrowing: Today they earn 85% as much, vs. just 50% in 1984.

The steel industry was a paradigm of the case for wage restraint. For years management gave away the store to keep the labor peace; by 1982 average compensation, at $23 an hour, was 85% above the U.S. manufacturing average and barely on the same planet with rates in other countries. That has all changed. Compensation hasn't risen a nickel since 1982. Moderate wage increases from here on won't turn big steel back into a growth industry—20 million tons of capacity must still be cut in the U.S. alone. But along with work-rule changes, modernization, and the savage restructuring that has cut employment and capacity, they will help to keep the industry in business.

Productivity in U.S. steel trails that of Germany, but is now as high as in Japan. Labor costs per ton—the primary criterion of international competitiveness—were nearly three times costs in Japan or Germany in 1982. Now they have started to converge with those in other industrialized countries, according to John Jacobson, an analyst at the WEFA Group economic consulting firm. The real challenge, says Jacobson, is to displace German and Japanese exports in third markets. Since the U.S. now ranks 20th in exports, behind a cluster of African nations, such a development seems unlikely. Still, hope springs eternal. In a joint venture with Korea's Pohang Steel, USX will overhaul a West Coast plant (in, naturally, Pittsburg, California) to supply sheet to nearby appliance and can plants. Says Earle McIntire, a spokesman for USS/Posco Industries: "We also see some opportunities for exporting from here to the Pacific Rim. It would be a neat thing to pull off." Sure would.

Along with cutting costs, U.S. manufacturers are scoring powerful productivity gains. Since 1981 U.S. manufacturing productivity has been growing faster than that of other industrialized countries. Its long-term trend, around 3.5% a year, is nearly twice the rate of the late Seventies and matches that of the Sixties.

Productivity growth has been fastest in such heavily restructured industries as autos, where output per hour has been rising 6% a year since 1981. Ford, for example, turned out 10% more cars last year than it did in 1978, with 47% fewer production workers. A recent study of 38 car assembly plants in 13 countries by John Krafcik, an auto consultant at MIT, showed that U.S. plants no longer lag behind the Japanese in productivity across the board. Incredibly, some American plants—and relatively ordinary ones, at that, with no ranked masses of robots—had higher productivity than many of their counterparts in Japan.

Greater efficiency has helped lower production costs. At current exchange rates, the famous $2,500 cost gap between cars made in Detroit and in Toyota City has disappeared. And costs are 5% to 10% lower than in Europe. That is an added incentive—apart from import quotas—for Japanese and even Korean carmakers to set up American factories. By 1990 Japan will have built ten such plants producing 2.5 million cars, either in partnership with U.S. companies or on their own—the equivalent of another Chrysler.

The competitive picture for U.S. industry snaps into focus when you add up the elements. First tally the smaller wage hikes and healthier productivity growth to get labor costs per unit of output—the biggest factor by far in overall costs. On average, they have been level or falling during the Eighties in the U.S. while rising some 15% in other industrialized countries. Now combine these trends with the dollar's fall. Result: U.S. unit labor costs are more competitive now than they were in 1980. The International Monetary Fund's relative unit labor cost index, which compares the U.S. with other industrialized countries, is a full

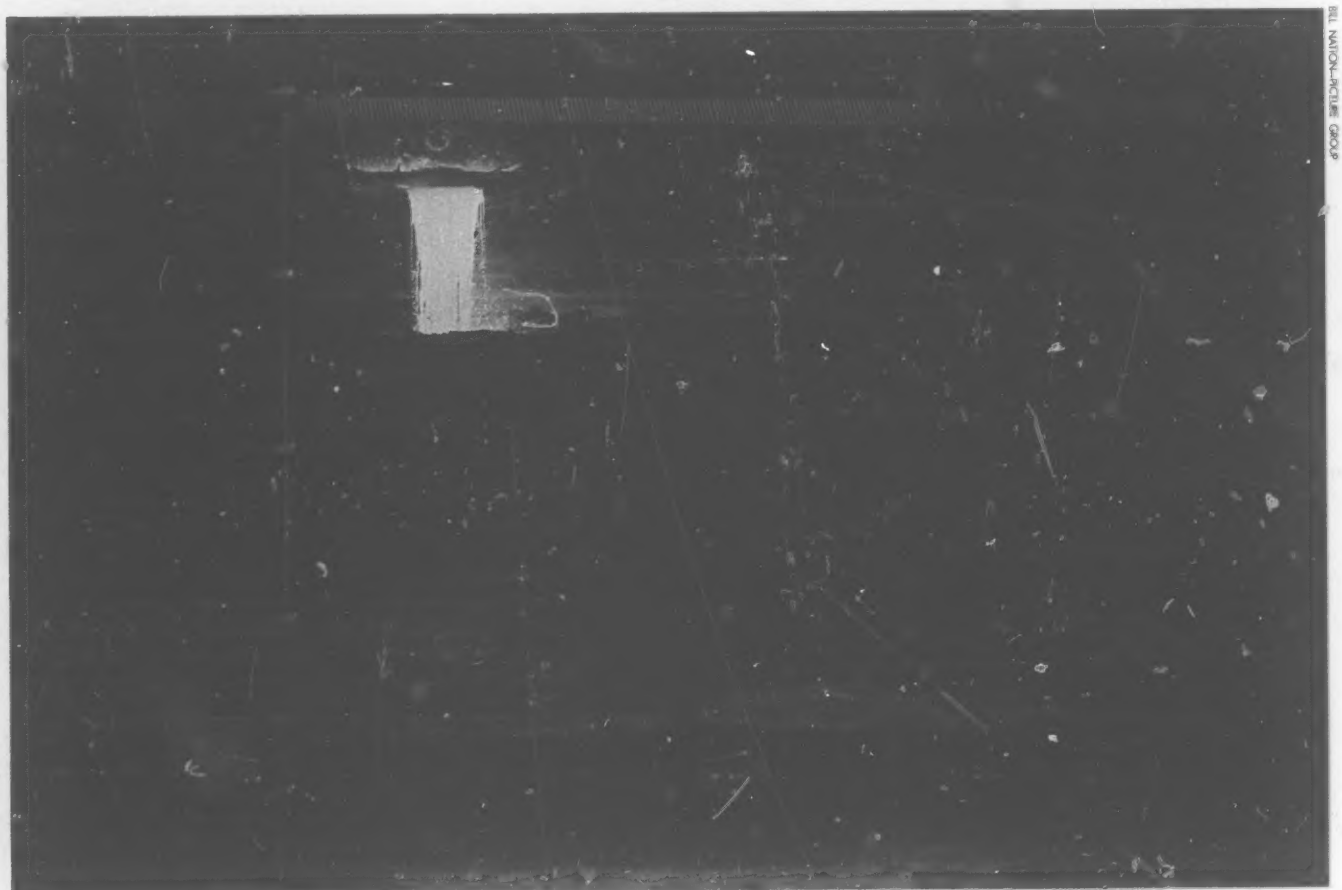
10% lower now. Meantime, wholesale prices —which reflect not only labor but energy, material, and transportation costs, among others—have been rising about 2.7% a year in the U.S. during the Eighties, vs. 6.3% in Europe. The IMF's relative index of producer prices for the U.S. now puts it 3% below its 1980 level.

FOR MANY INDUSTRIES, competitiveness increasingly means picking the right markets. Thanks to mammoth modernization efforts, the productivity of U.S. textile mills has risen more than 20% in the past five years, says Peter Harding, a partner at the New York management consulting firm of Kurt Salmon Associates. It is now the highest in the world. But while American textile manufacturers are currently on equal footing with those of Italy and Japan, their costs are 30% to 40% higher than in the NICs for products like lightweight shirting. Thus, the industry is concentrating on sophisticated materials like industrial fabrics, and goods such as sheets and towels that can be made using little direct labor. According to a recent study by the Office of Technology Assessment, quality has improved across a broad spectrum of goods. Textile exports, mostly to Europe and Canada, have soared 14% in the past year. Despite fierce competition, the U.S. share of world exports has been holding at around 6% since 1985. Japanese companies—and even some Korean ones—are looking to set up U.S. factories.

American producers are also fighting back by developing a service edge in the domestic market. The industry is counting on a computerized inventory management and ordering program called Quick Response that provides close coordination between textile mills, apparel manufacturers, and retailers. The system cuts in half the time between a fabric order and delivery of the garment to a retailer and gives all the parties better information for planning.

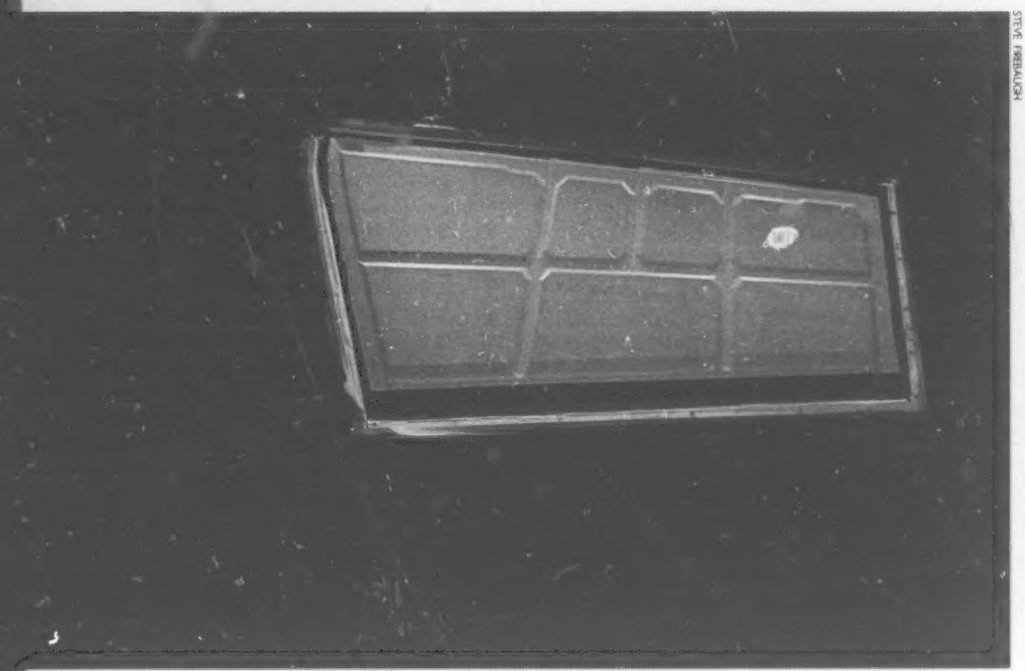
Few trends have made life more difficult for U.S. manufacturers than the increasingly rapid dissemination of the new technologies that once ensured its leadership. Other countries catch up fast. This has happened with aerospace, where the former U.S. monopoly is gradually becoming an oligopoly, and with semiconductors. Still, not all knowledge dribbles away, and America continues to make impressive technical advances. Contrary to popular notions that the U.S. has been giving technological development short shrift, the ratio of engineers and scientists to the total labor force has been rising faster than it has in either Germany or Japan. R&D spending has also increased sharply. As a share of GNP, it is near its 1969 peak and about the same as in Germany and Japan. While much is devoted to military research, manufacturing R&D has been increasing 8% annually after adjusting for inflation in the past seven years, three times the rate of the 1970s.

A deep pool of technical talent is one reason the U.S. remains the world leader in exports of instruments—among them, avionics, process control systems, and medical instruments. With the single—and important—exception of semiconductor test



BILL NATION—PICTURE GROUP

South Korea's low labor costs—*only about $20 a ton at the Posco Steel Mill—help make its steel industry one of the few that are growing.*



STEVE FIREBAUGH

Double strength: *a Boeing 757 rudder built with U.S.-made epoxy graphite composite*

equipment, U.S. manufacturers of other instruments more than measure up. Their share of world exports is climbing back after sagging in the mid-Eighties. And according to Marge Donnelly, an analyst at the U.S. Department of Commerce, U.S. manufacturers have a clear-cut lead in technology. European producers, namely Germany and France, have generally offered good products at reasonable prices but aren't on the frontiers of product development.

The biggest competitive threat comes from Japan, which dominates the market in VLSI (very large scale integration) testing devices, which check the quality of elaborate chips. Japanese exporters, such as Fujitsu's Advantest subsidiary, are responding to the strong yen by rushing to start production in the U.S. But American manufacturers have a big advantage in software, and their lead is likely to lengthen.

Leadership in software should also help the U.S. computer industry stay on top of the world. Buyers look for packaged solutions that combine hardware and software, and depend heavily on the seller's expertise in marketing and servicing the system once it's installed. Says Van Weathers, an analyst at Dataquest, a market research firm: "You can't achieve that by manufacturing lots and lots of boxes." A recent survey of the industry by *Datamation* revealed that the overwhelming majority of respondents believe the U.S. is the leader in every product group from supercomputers to software. The Japanese computer industry does better at home than in export markets, to which it mainly ships disk storage devices, printer components, and other peripherals that do not depend on much system expertise.

THE REWARDS of spending on R&D (and the penalties for not spending) are especially evident in the pharmaceutical industry. Until the mid-Sixties the U.S. dominated world markets. Then Europe and Japan began outspending it on R&D and capturing a growing share of new patent drugs—the precursor of future market shares and profitability. Recently, however, U.S. firms have boosted R&D outlays. These have jumped about 15% a year during the Eighties, with the ratio of R&D spending to sales also topping 15% recently. After declining sharply from the mid-Sixties to mid-Eighties, the U.S. share of new drug introductions is back up to one-third. The Japanese share, however, has lately also climbed to one-third, up from about one-fifth in the late Seventies.

Heavy R&D spending—some of it by the Defense Department—also gives the U.S. an edge in so-called engineering plastics, used in packaging (for food cooked in microwave ovens), autos, housings for computers, and aircraft, like the component at left. Though they account for only 5% of plastics production, export demand for engineering plastics has tripled in the past year. At the commodity end of the plastics business, by contrast, the U.S. is still the world's largest producer and consumer, but many American manufacturers have moved offshore; feedstocks determine cost competitiveness and oil-rich countries, including Mexico, Canada, and Saudi Arabia, are the low-cost producers.

For some industries, just being in the U.S. will ensure a certain amount of business. Take machine tools. The Germans, the world's second-biggest producer after Japan, dominate the high-performance, high-precision niche in most product lines. The Japanese control the low end. While top U.S. companies—the likes of Ingersoll Milling, Cincinnati Milacron, and Cross & Trecker—can compete head-on with the best of the Germans and Japanese, most others possess no clear-cut technological advantage except in software for computer-controlled machines.

Yet the American industry is about to get a break from several trends. The trade picture has already brightened. Exports shot up 16% last year, while the flood of imports slowed a bit. The rush by Japanese automakers to set up production in the U.S. will bring important new customers. Japanese machine toolmakers, including Okuma, Japan's largest, are also investing in factories in the U.S., often in joint ventures with American-owned companies. "The single most important thing is that North America is now the most cost-effective location for manufacturing in the world," says Richard Lindgren, CEO of Cross & Trecker. "This is the biggest market, there is more volume here, and high volume drives down unit costs."

Is Lindgren complacent about this development? Hardly. "We can compete now, but it's a moving target," he says. "We aren't going to be able to raise our prices much. So we have to continually improve productivity about 5% to 6% a year." Despite flat revenues, Cross & Trecker has cut $20 million out of selling and administrative expenses in the past three years and has boosted productivity by one-third since 1979.

For many industries, a competitive home marketplace has proved to be as much of a comparative advantage as cheap raw materials or technical talent. Fierce domestic competition is one reason the U.S. telecommunications industry has not lost its huge lead in technology, R&D, design, software, quality,

and cost. Says Francis McInerney of Northern Business, a telecommunications research company: "Japanese and European companies are at a disadvantage because they don't have enough competition in their home markets. U.S. companies have been able to engineer a great leap forward because they saw firsthand what the competition could do."

Not every U.S. industry has risen to the challenge of the decade. The strong yen has demolished the Japanese semiconductor industry's 20% to 30% cost advantage in commodity chips. But whether U.S. producers are in a position to benefit remains to be seen. Says Glen Madland, chairman of Integrated Circuit Engineering in Scottsdale, Arizona: "We've been static. We haven't done anything." He points out that Japanese productivity is much higher: "The Japanese use four people plus automation, and we use 40 to do the same job." And U.S. yields—the ratio of usable chips to total production, which basically determines profitability—have not improved a lot. Says Madland: "Four years ago our yields were 45% and the Japanese yields were 90%. Now ours are 60% and theirs are 98%." He figures that the U.S. lags behind Japan by two or three years in chipmaking mastery.

In the meantime, Korea, which already has 3% or so of the world market in commodity chips, may triple its market share in the next five years. Though Korean yields are below those of the U.S., labor costs are just one-third to one-fifth as high. Davis expects market shares of the two big players to remain fairly stable. But if Sematech, the U.S. consortium that is supposed to help chipmakers improve their manufacturing skills, proves a failure, Madland is prepared to believe that Japan's market share, now 50% vs. the U.S.'s 40%, could jump to 60%.

SEMICONDUCTORS serve as a reminder of how quickly an industry can lose its world leadership. It would not take much of a lapse on the part of the newly revitalized U.S. manufacturers to fall behind again—particularly if the Europeans and Japanese respond to the strong-currency pressure as the U.S. did. The Japanese in particular have already shown striking resiliency in adapting to adversity.

The U.S. would pay a high price for losing the momentum it has gained recently. The unsustainable trade deficit would demand a much steeper fall in the dollar, swelling inflation and further diminishing competitiveness. Then hard times would arrive with a vengeance. The U.S. could stay competitive only if its wages fell, shrinking American living standards and, perhaps, forcing the nation to export the fruits of low-wage labor—the NIC syndrome—to settle its trade accounts.

But in general the companies that met the trials of the early Eighties most successfully did so by fundamentally changing their management philosophies, and they have emerged as industry leaders. At the same time the U.S. market, which was still insular back in the Seventies, has become the world's most competitive. As more foreign companies set up their new factories on American soil, the competition will grow hotter yet. In such an environment, those reborn managers seem most unlikely to fall from grace again. ■

BARTH FALKENBERG

Born in the U.S.A., *this Accord is on its way from Honda's plant in Marysville, Ohio, to Taiwan. Japan next? Honda is studying the possibility.*